Operating and Installation Manual

Fire Damper
Type FKA-EU

according to Declaration of Performance

DoP / FKA-EU / DE / 2013 / 001

CE

TROX® TECHNIK

The art of handling air

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1 General information

This operating and installation manual describes the following variants of the fire damper:

- FKA-EU with fusible link
- FKA-EU with spring return actuator

To ensure complete functioning of the fire damper it is essential to read the provided operating and installation manual before starting any work, and to comply with it. The manual must be given to the facilities manager when handing over the system. The facilities manager must include the manual with the system documentation.

The manufacturer does not accept any liability for any malfunction or damage resulting from non-compliance with this manual or non-compliance with relevant statutory regulations.

This operating and installation manual is intended for specialist consultants, developers, and operators of systems in which the fire dampers are to be installed. This manual is also intended for people conducting the following work:

- Transport and storage
- Installation
- Electrical connection
- Commissioning
- Operation
- Maintenance
- Decommissioning, removal and disposal

Scope of this manual

This operating and installation manual applies to fire dampers that are installed in Germany. National regulations must be observed.

Other applicable documentation

In addition to this manual, the declaration of performance DoP / FKA-EU / DE / 2013 / 001 applies.

Symbols used in this manual

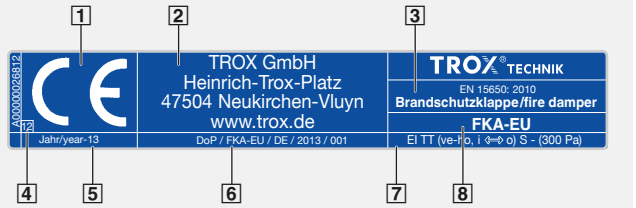
Danger!
Designates danger to life and limb due to electrical voltage.

Warning!
Designates danger to life and limb.

Important!
Designates danger that can cause minor personal injury or damage to property.

Note!
Designates important notes or information.

Rating plate with CE marking



1 CE mark
2 Manufacturer's address
3 Number of the European standard and year of its publication
4 The last two digits of the year of the marking
5 Year of manufacture
6 No. of the declaration of performance
7 Regulated characteristics
The fire resistance class depends on the application and may vary → P. 8
8 Type

2 Safety and correct use

General information regarding safety

Only skilled, qualified personnel are allowed to perform the described work on the fire damper.
Only skilled qualified electricians are allowed to work on the electrical system.

The installation location must be easily accessible and have sufficient clearance for electrical connection and maintenance of the fire damper.

Standards and guidelines

- EN 15650:2010 Ventilation for buildings – fire dampers
- Classification to EN 13501-3 → P. 8
- Tested to EN 1366-2
- Closed blade air leakage according to EN 1751, class 2
- Casing air leakage according to EN 1751, class C; (B+H) ≤ 700, class B

Repair and replacement parts

The FK-EU fire damper is a safety related product that has been especially developed for fire protection. To maintain the function, only original TROX replacement parts must be used.

Environmental protection

To protect the environment observe the following:

- Dispose of packaging in an environmentally sound manner.
- Have used fire damper components or the used fire damper only disposed of by an authorised company.
- Dispose of electronic components according to the local electronic waste regulations.

Correct use

The fire damper is used as an automatic shut-off device to prevent fire and smoke from spreading through ducting.

The fire damper is suitable for supply air and extract air systems. Use of the fire damper is only allowed in compliance with national fire protection regulations.

In addition, installation regulations and the technical data in this manual must be complied with.

Incorrect use

The following applications are not allowed:

- Use as a smoke extract damper.
- Use in potentially explosive atmospheres.
- Use outdoors without sufficient protection against the effects of weather.
- Use in extract air systems in commercial kitchens (kitchen extract air in general)
- Use in ventilation systems in which high levels of dust and pollution, extreme humidity, or chemical contamination may impair the damper function
- Installation in a way that prevents an inspection of the internal components of the fire damper

Changes to the fire damper and the use of replacement parts that have not been approved by TROX are not permitted.

Residual risks

TROX fire dampers are subject to strict quality controls during manufacturing. In addition, function tests are performed before delivery. In addition, a functional test is performed before delivery.

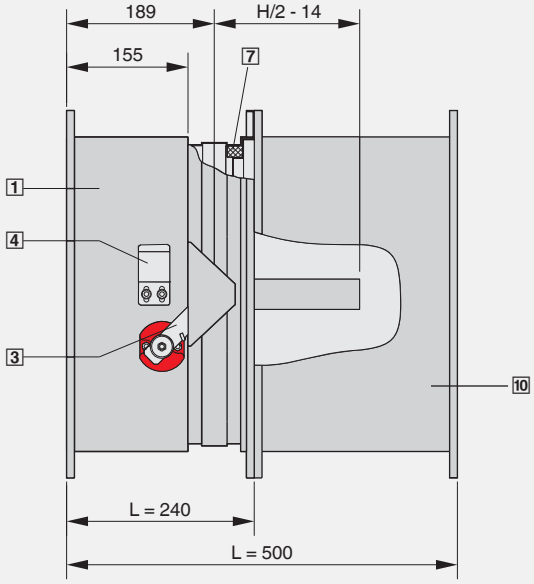
Damage can, however, occur during transport or installation and impair the function of the fire damper.

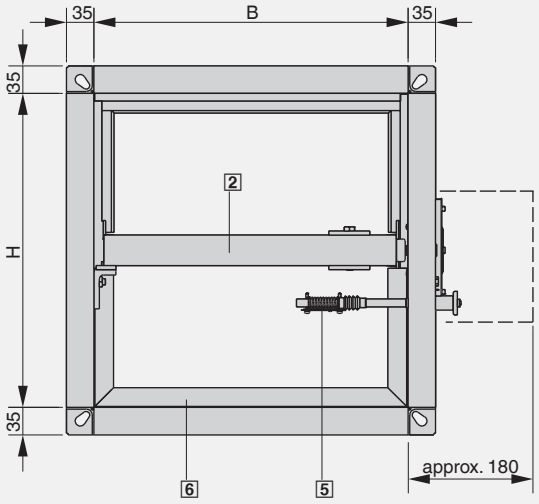
In any case, the proper function of the fire damper must be checked during commissioning, and ensured through regular maintenance while in use.

3 Product description

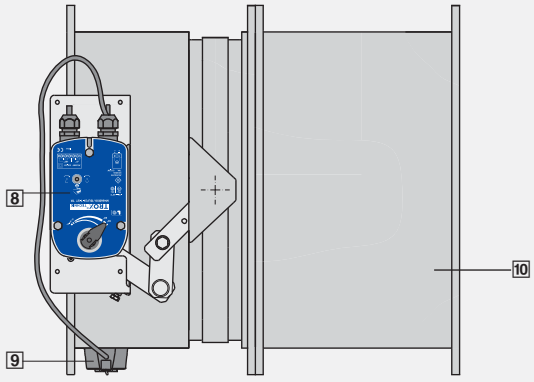
Product overview and dimensions

FKA-EU with fusible link





FKA-EU with spring return actuator



----- Keep clear to provide access to the release mechanism

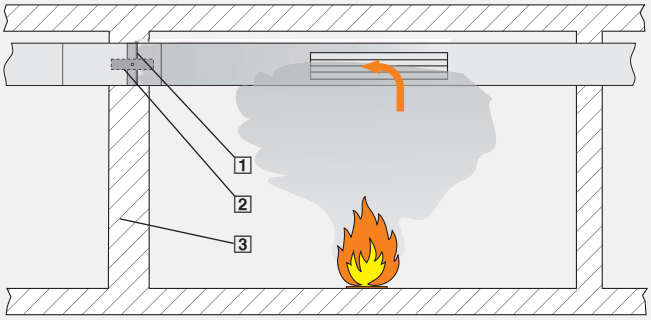
1 Casing (L = 240 mm)
2 Damper blade
3 Handle
4 Interlock
5 Fusible link
6 Perimeter travel stop (B × H > 400 × 300)
7 Seal
8 Spring return actuator
9 Thermoelectric release mechanism
10 Extension piece (for L = 500 mm)

FKA-EU with fusible link
Dimensions [mm] / Weight [kg] for L = 240 mm / L = 500 mm

H	B																			
	200	250	300	350	400	450	500	550	600	650	700	750	800	900	1000	1100	1200	1300	1400	1500
200	7/11	8/12	8/13	9/14	10/15	10/16	11/17	12/18	13/19	13/20	14/21	14/22	15/23	18/26	19/28	21/30	22/32	23/34	25/36	26/38
250	8/12	8/13	9/14	10/15	11/16	12/17	13/19	13/20	14/21	15/22	16/23	17/24	17/25	20/29	22/31	23/33	25/36	27/38	28/40	30/42
300	8/13	9/14	10/15	11/16	12/18	13/19	14/20	15/21	16/23	17/24	18/25	18/26	19/28	22/31	24/34	26/36	28/39	30/41	32/44	33/46
350	9/14	10/15	11/16	12/18	13/19	14/21	15/22	16/23	17/25	18/26	19/27	20/29	21/30	25/34	27/37	29/39	31/42	33/45	35/47	37/50
400	10/15	11/16	12/18	13/19	14/21	16/22	17/24	18/25	19/27	20/28	21/30	22/31	24/32	27/36	29/39	32/42	34/45	36/48	38/51	41/54
450			13/19	14/21	16/22	17/24	18/25	20/26	21/28	22/30	23/32	24/33	26/35	29/39	32/42	34/45	37/49	39/52	42/55	44/58
500			14/20	15/22	17/24	18/25	19/27	21/28	22/30	23/32	25/34	26/35	28/37	31/42	34/45	37/48	40/52	42/55	45/59	48/62
550			15/22	16/23	18/25	19/27	21/29	22/30	23/32	25/34	27/36	28/38	30/40	34/45	37/47	39/51	42/55	45/59	49/62	52/66
600			16/23	17/25	19/27	21/28	22/30	23/32	25/34	27/36	29/38	30/40	32/42	36/47	39/51	42/54	45/58	49/62	52/66	55/70
650			17/24	19/26	21/28	22/30	23/32	25/34	27/36	29/38	31/40	32/42	34/45	38/49	42/54	45/58	49/62	52/65	55/69	59/74
700			18/25	20/27	22/29	23/32	25/34	26/35	29/38	31/40	32/42	34/45	36/47	40/52	44/56	48/61	51/65	55/69	59/73	62/78
750			19/27	21/28	23/31	25/33	26/35	28/37	30/40	32/42	34/44	36/46	38/49	43/55	46/59	51/64	54/69	58/72	62/77	65/81
800			20/28	22/30	24/32	26/35	28/37	30/40	32/42	34/44	36/47	38/49	40/51	45/57	49/62	53/66	57/71	61/76	65/81	69/85

3 Product description

Functional diagram



[1] Damper blade OPEN
[2] Damper blade CLOSED in case of a fire
[3] Fire-resistant wall

Functional description

Type FKA-EU fire dampers are used as safety related components in ventilation systems. The fire damper is used as a shut-off device to prevent fire and smoke from spreading through ducting.

During normal operation the damper blade is open to enable air passage through the ventilation system.

If the temperature increases in case of a fire, the damper blade closes. The damper is triggered either by a fusible link at 72 °C or thermoelectrically with a spring return actuator.

If the damper blade closes due to a temperature increase (i.e. in case of a fire), it must not be reopened.

The proper functioning of the fire damper can be tested in two ways, depending on the release mechanism → „Functional test“ P. 18.

FKA-EU with fusible link

If the temperature inside the fire damper rises to 72 °C, the fusible link triggers immediately. The coil spring mechanism then causes the fire damper to close.

As an option, the FKA-EU with a fusible link can be either supplied or subsequently fitted with one or two plug-in limit switches. The limit switches can signal the damper blade position to the central BMS or fire alarm system. One limit switch each is required for damper blade positions OPEN and CLOSED.

FKA-EU with spring return actuator

The spring return actuator enables the motorised opening and closing of the damper blade; it can be activated by the central BMS. As long as power is supplied to the actuator, the damper blade remains open.

In case of fire, the internal thermoelectric release mechanism closes the damper blade when at least one of the following is true:

- The temperature in the fire damper > 72 C.
- Ambient temperature outside the release mechanism > 72 °C.
- Interruption of the power supply (power off to close).

As standard, the spring return actuator is equipped with limit switches that can be used to indicate the damper blade position.

TROX smoke detector

To prevent smoke from spreading even before the temperature reaches 72 °C, a smoke detector such as type RM-O-3-D or RM-O-VS-D can be used to trigger closing of the damper blade. This is only possible when the fire damper is equipped with a spring return actuator.

4 Technical data

Limit switch for fire damper with fusible link	
Connecting cable length / cross section	1 m / 3 × 0.34 mm²
Protection level	IP 66
Type of contact	1 changeover contact, gold-plated
Max. switching current	0.5 A
Max. switching voltage	30 V DC, 250 V AC
Contact resistance	approx. 30 mΩ

Spring return actuator BLF		230-T TR	24-T-ST TR
Supply voltage		230 V AC ±14 % 50/60 Hz	24 V AC ±20 % 50/60 Hz or 24 V DC -10 % / +20 %
Power rating	Spring compression	6 W	5 W
	Hold position	3 W	2.5 W
	Rating	7 VA	
Running time	Motor / spring return	40 to 75 s / 20 s	
Limit switch	Type of contact	2 changeover contacts	
	Switching voltage	5 – 120 V DC / 5 – 250 V AC	
	Switching current	1 mA – 3 A	
	Contact resistance	< 100 mΩ	
IEC protection class		II	III
Protection level		IP54	
Storage temperature		–40 ... +50 °C	
Ambient temperature		–30 ... +50 °C [1]	
Ambient humidity		≤ 95 % RH, non-condensing	
Connecting cable	Drive	1 m / 2 × 0.75 mm²	
	Limit switch	1 m / 6 × 0.75 mm²	

Spring return actuator type BF		230-T-2 TR	24-T-ST-2 TR
Supply voltage		230 V AC ±14 % 50/60 Hz	24 V AC ±20 % 50/60 Hz or 24 V DC -10 % / +20 %
Power rating	Spring compression	8 W	7 W
	Hold position	3 W	2 W
	Rating	12.5 VA	10 VA
Running time	Motor / spring return	approx. 140 s / approx. 16 s	
Limit switch	Type of contact	2 changeover contacts	
	Switching voltage	5 – 120 V DC / 5 – 250 V AC	
	Switching current	1 mA – 6 A	
	Contact resistance	< 100 mΩ	
IEC protection class		II	III
Protection level		IP54	
Storage temperature		–40 ... +50 °C	
Ambient temperature		–30 ... +50 °C [1]	
Ambient humidity		≤ 95 % RH, non-condensing	
Connecting cable	Drive	1 m / 2 × 0.75 mm²	
	Limit switch	1 m / 6 × 0.75 mm²	

[1] Up to 75 °C the safe position will definitely be reached.

5 Transport, storage, and packaging

Important!
Danger of injury from edges and sheet metal parts.
Always wear protective gloves when handling the fire damper.

Delivery check

Check delivered items immediately after arrival for transport damage and completeness. In case of any damage or an incomplete shipment, contact the shipping company and your supplier immediately.

A complete shipment includes:

- Type FKA-EU fire damper
- Attachments / accessories, if any
- Operating manual (1 per shipment)

Transport on site

If possible, take the fire damper in its transport packaging up to the installation location.

Storage

If the fire damper has to be stored temporarily:

- Remove any plastic wrapping.
- Store the fire damper in a clean place, away from dust and dirt.
- Store the unit in a dry place and away from direct sunlight.
- Do not expose the fire damper (not even with its packaging) to the effects of weather.
- Do not store the fire damper below -40 °C or above 50 °C.

Packaging

Properly dispose of packaging material.

6 Installation

General installation information

Important!
Danger of injury from edges and sheet metal parts.
Always wear protective gloves when handling the fire damper.

The FKA-EU fire damper can be installed in walls and ceiling slabs made of various materials. See the table below for details.

The fire damper can be installed such that the damper blade shaft is horizontal or vertical; the airflow direction is not critical.

In case of ceiling slab installation, the fire damper can be installed upright or suspended.

Requirements:

- Operating components or the electric actuator must remain accessible for inspection and maintenance work.
- If the fire damper is of size L = 240 mm, extend it (as an accessory or by others) with an extension piece on the installation side, or connect the damper to the ducting before installation.
- Perform a functional test of the fire damper before installation. → P. 18 - 19

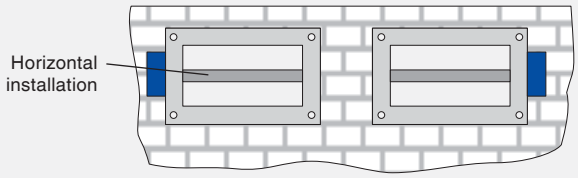
Acceptable mortars for mortar-based installation

In case of mortar-based installation, the open spaces between the fire damper and the wall or ceiling slab must be closed off with mortar. Entrapped air is to be avoided.
The mortar bed depth must be at least 100 mm.

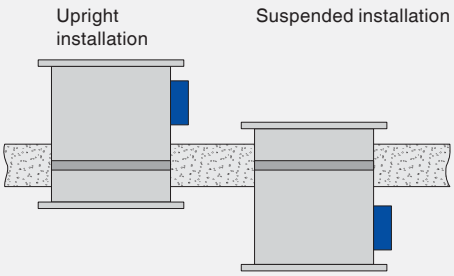
The following mortars are acceptable:

- EN 998-2: Classes M 2.5 to M 10 or fire protection mortar of Classes M 2.5 to M 10
- Equivalent mortars that meet the requirements of the above standards
- Gypsum mortar or concrete

Wall installation options



Ceiling slab installation options



Note!
Installation in solid walls and ceiling slabs whose class of performance is lower than that of the fire damper is approved.

In this case the class of performance of the wall or ceiling slab applies also to the fire damper.

Overview of installation situations and fire resistance class according to 13501-3

Installation location	Construction and building material	Minimum thickness [mm]	Class of performance	Casing length		Installation details on page
				L = 240	L = 500	
Solid walls	Solid walls, gross density ≥ 500 kg/m³	115	EI 120 (v_e i ↔ o) S	×	×	9 – 10
Solid ceiling slabs	Solid ceiling slabs, gross density ≥ 600 kg/m³	150	EI 120 (h_o i ↔ o) S	×	×	11
Remote from solid walls	In fire-resistant ducting	–	EI 60 (v_e i ← o) S	×	×	14
Lightweight partition wall with metal support	With metal support structure and cladding on both sides, with cover strips	125	EI 120 (v_e i ↔ o) S[1]	×	×	12 – 13
	With metal support structure and cladding on both sides, without cover strips	100	EI 60 (v_e i ↔ o) S	×	×	14 – 15

[1] For lightweight partition walls ≥ F120

6 Installation

Solid walls

Mortar-based installation

For mortar-based installation of fire dampers in solid walls the fire damper is concreted into the wall during construction or alternatively installed after construction with a perimeter mortar bed.

Requirements

- Solid walls or fire walls (if referred to as such) made of, for example, concrete, aerated concrete, masonry, or solid gypsum wallboards according to EN 12859 (without hollow spaces), gross density ≥ 500 kg/m^3, and a minimum thickness of 100 mm
- 75 mm minimum distance from the fire damper to load bearing structural elements.
- 200 mm minimum distance between two fire dampers

Warning!
Contamination or damage will impair the function of the fire damper.

Protect the fire damper from contamination and damage:

- When installing the fire damper, place a prop near the damper blade to support and protect the sides of the casing.
- Cover the flange openings and release mechanism (e.g. with plastic foil) to protect them from mortar and dripping water.

Installation while erecting the wall

If the fire damper is installed as the wall is being erected, the perimeter gap »s« is not required.

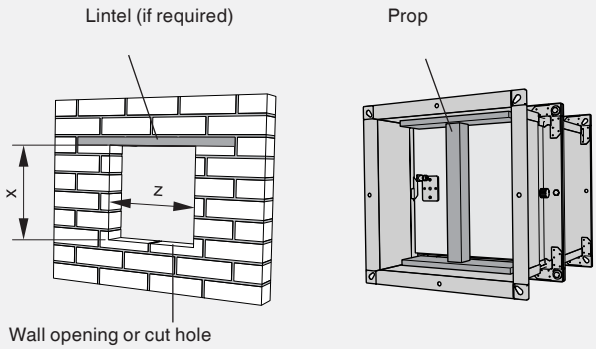
To install the fire damper, proceed as follows:

- Place the fire damper on a bed of mortar at the intended position and secure it.
- Make sure that the distance from the flange on the operating side to the wall is 155 mm.
- If the fire damper is of size L = 240 mm, extend it with an extension piece on the installation side, or connect the damper to the ducting before installation.
- Brick the fire damper into the wall.

Installation after completing the wall

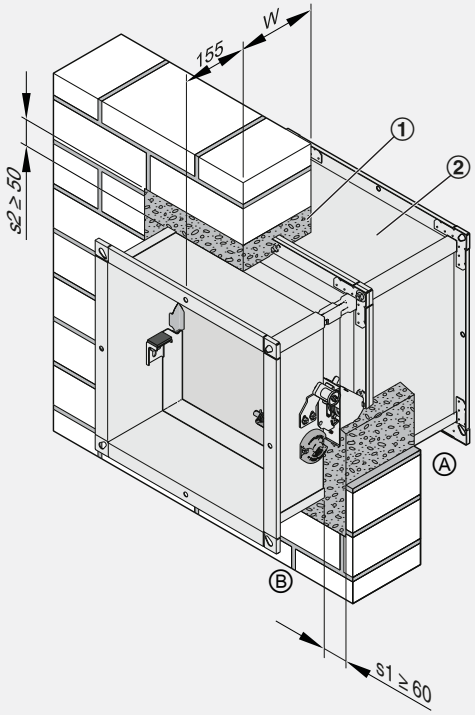
To install the fire damper into a completed wall, proceed as follows:

- Create an installation opening.
- Push the fire damper into the wall opening and secure it, e.g. with wedges.
- Make sure that the distance from the flange on the operating side to the wall is 155 mm.
- If the fire damper is of size L = 240 mm, extend it with an extension piece on the installation side, or connect the damper to the ducting before installation.
- Close off the perimeter gap »s« with mortar. The mortar bed depth must be at least 125 mm.



Wall opening or cut hole

x ≥ B + 120 mm
z ≥ H + 100 mm



① Mortar → „Acceptable mortars for mortar-based installation“ see → P. 8
② Extension piece
Ⓐ Installation side
Ⓑ Operating side

After installation

- Clean the fire damper and wash off any residual mortar with water.
- Remove prop, if any, after the mortar/concrete has hardened.
- After the hardening of the mortar, perform a functional test of the fire damper. → P. 18 - 19
- Connect the ducting. → P. 16
- Establish the electrical connection. → P. 17

6 Installation

Solid ceiling slabs

Mortar-based installation

Fire dampers are concreted in during the construction of the ceiling or installed using a perimeter mortar-mix after the completion of the ceiling slab.

Requirements

- Solid ceiling slabs made of concrete or aerated concrete, gross density ≥ 600 kg/m³ and D ≥ 150 mm
- 40 mm minimum distance to load bearing structural elements.
- 200 mm minimum distance between two fire dampers

Warning!
Contamination or damage will impair the function of the fire damper.

Protect the fire damper from contamination and damage:

- When installing the fire damper, place a prop near the damper blade to support and protect the sides of the casing.
- Cover the flange openings and release mechanism (e.g. with plastic foil) to protect them from mortar and dripping water.

Installation while completing the ceiling slab

If the fire damper is installed as the ceiling slab is being completed, the perimeter gap »s« is not required.

- Place the fire damper in the installation location and secure it.
- Protect the inside of damper and the operating components/actuator, e.g. with plastic foil.
- If the fire damper is of size L = 240 mm, extend it with an extension piece on the installation side, or connect the damper to the ducting before installation.
- Cast the concrete around the fire damper.

Installation after completing the ceiling slab

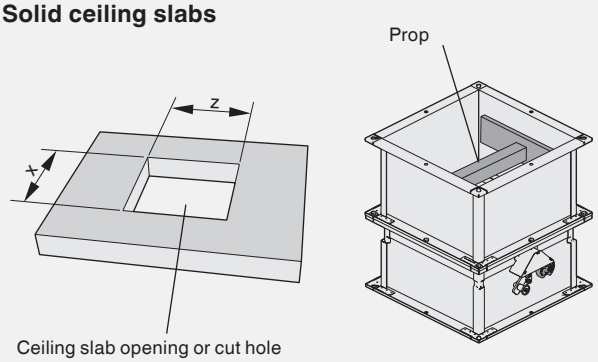
To install the fire damper into a completed ceiling slab, proceed as follows:

- Cut a hole.
- Push the fire damper into the opening in the ceiling slab and secure it, e.g. with wedges.
- If the fire damper is of size L = 240 mm, extend it with an extension piece on the installation side, or connect the damper to the ducting before installation.
- Close off the perimeter gap »s« with mortar. The mortar bed depth must be at least 150 mm.

After installation

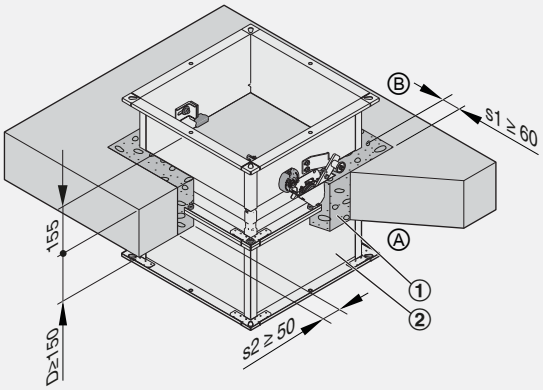
- Clean the fire damper and wash off any residual mortar with water.
- Remove prop, if any, after the mortar/concrete has hardened.
- After the hardening of the mortar, perform a functional test of the fire damper. → P. 18 - 19
- Connect the ducting. → P. 16
- Establish the electrical connection. → P. 17

Solid ceiling slabs

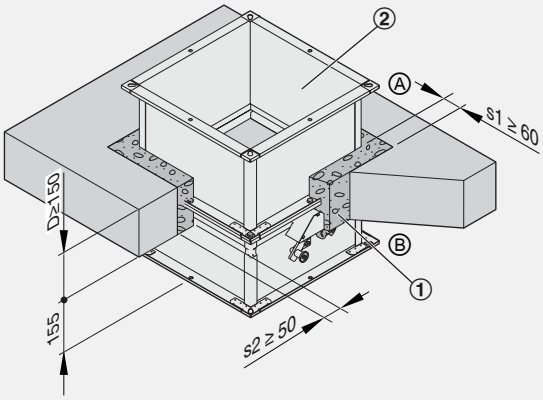


x ≥ B + 120 mm
z ≥ H + 100 mm

Upright installation



Suspended installation



① Mortar → „Acceptable mortars for mortar-based installation“ see → P. 8
② Extension piece
Ⓐ Installation side
Ⓑ Operating side

6 Installation

Lightweight partition walls with metal support structure and cladding on both sides

Mortar-based installation with cover strips – EI 120 (v_e i ↔ o) S

Fire dampers can be installed into lightweight partition walls using a perimeter mortar mix.

Requirements

- Lightweight partition walls with metal support structure, minimum thickness 125 mm as described in manufacturer's proof of use report, with mineral wool
- 75 mm minimum distance from the fire damper to load bearing structural elements.
- 200 mm minimum distance between two fire dampers

Warning!
Contamination or damage will impair the function of the fire damper.

Protect the fire damper from contamination and damage.

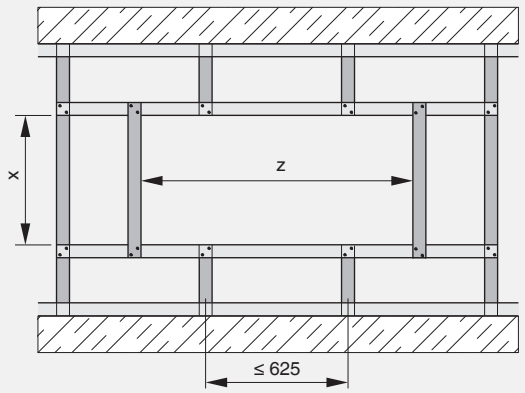
To install the fire damper, proceed as follows:

- Erect the metal support structure according to the manufacturer's instructions. Provide the installation opening with support profiles as shown in the figure to the right.
- Mount the wall cladding.
- Push the fire damper into the wall opening. Make sure that the distance from the flange on the operating side to the wall is 155 mm.
- Secure the fire damper in place.
- If the fire damper is of size L = 240 mm, extend it with an extension piece on the installation side, or connect the damper to the ducting before installation. Important: Flexible connectors must be used when connecting the damper to the ducting.
- The perimeter gap »s« must be completely closed off with mortar. The mortar bed depth must be at least 125 mm.
- On both sides of the lightweight partition wall fix cover strips around the fire damper; there must be no gaps. Screw the cover strips to the metal support structure (distance between screws: ≤ 200 mm).

After installation

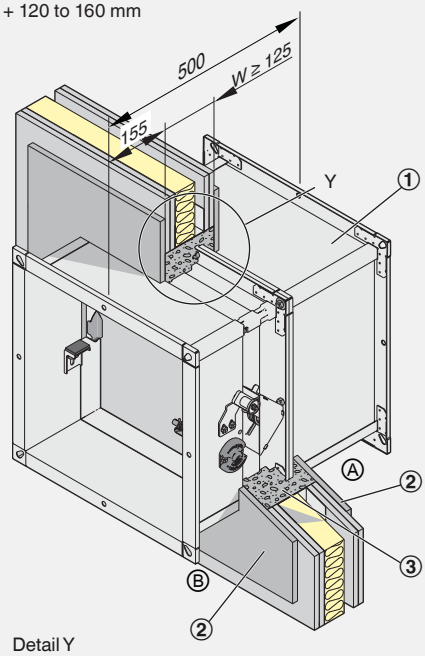
- Clean the fire damper and wash off any residual mortar with water.
- After the hardening of the mortar, perform a functional test of the fire damper. → P. 18
- Connect the ducting. → P. 16
- Establish the electrical connection. → P. 17

Metal support structure

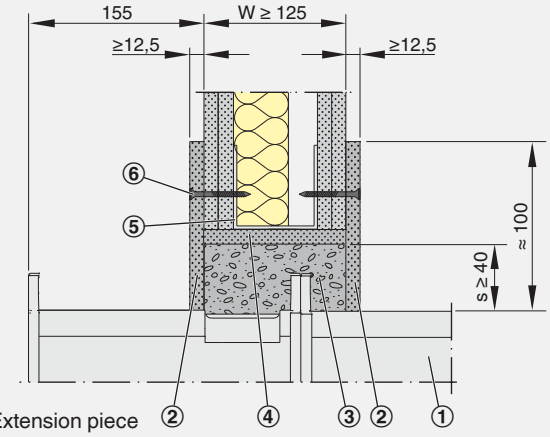


x = H + 100 to 140 mm
z = B + 120 to 160 mm

Screw or rivet the profiles



Detail Y



① Extension piece
② Cover strip
③ Mortar → „Acceptable mortars for mortar-based installation“ see → P. 8
④ Optional trim panels
⑤ Perimeter metal profile
⑥ Dry wall screw
Ⓐ Installation side
Ⓑ Operating side

6 Installation

Lightweight partition walls with metal support structure and cladding on both sides

Mortar-based installation without cover strips – EI 60 (v_e i ↔ o) S

Fire dampers can be installed into lightweight partition walls using a perimeter mortar mix.

Requirements

- Lightweight partition walls with metal support structure and cladding on both sides with mineral wool and with minimum thickness of 100 mm
- 75 mm minimum distance from the fire damper to load bearing structural elements.
- 200 mm minimum distance between two fire dampers

Warning!
Contamination or damage will impair the function of the fire damper.

Protect the fire damper from contamination and damage.

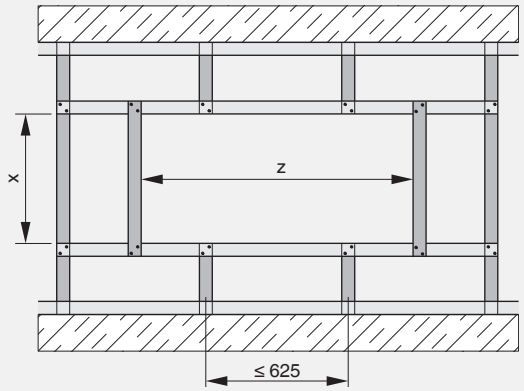
To install the fire damper, proceed as follows:

- Erect the metal support structure according to the manufacturer's instructions. Provide the installation opening with support profiles as shown in the figure to the right.
- Mount the wall cladding.
- Push the fire damper into the wall opening. Make sure that the distance from the flange on the operating side to the wall is 155 mm.
- Secure the fire damper in place.
- If the fire damper is of size L = 240 mm, extend it with an extension piece on the installation side, or connect the damper to the ducting before installation. Important: Flexible connectors must be used when connecting the damper to the ducting.
- The perimeter gap »s« must be completely closed off with mortar. The mortar bed depth must be at least 100 mm.

After installation

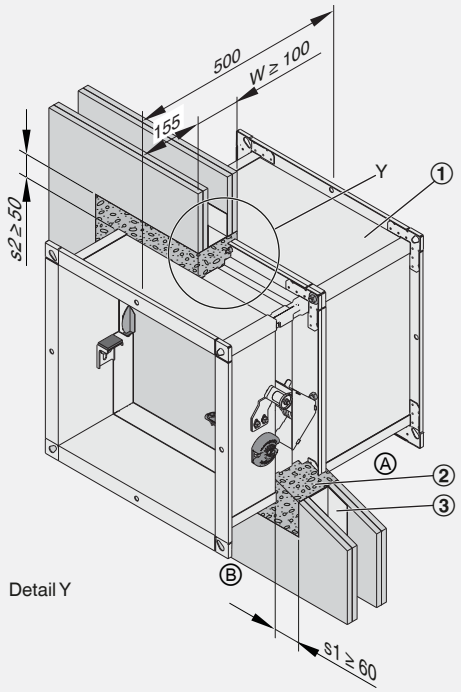
- Clean the fire damper and wash off any residual mortar with water.
- After the hardening of the mortar, perform a functional test of the fire damper. → P. 18
- Connect the ducting. → P. 16
- Establish the electrical connection. → P. 17

Metal support structure

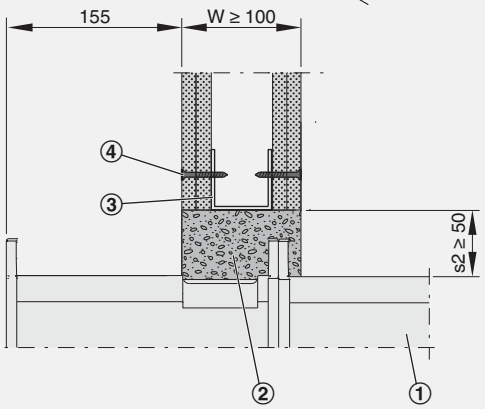


x = H + 100 to 140 mm
z = B + 120 to 160 mm

Screw or rivet the profiles



Detail Y



① Extension piece
② Mortar
③ Perimeter metal profile
④ Dry wall screw
Ⓐ Installation side
Ⓑ Operating side

6 Installation

Remote from solid walls

Installation into fire-resistant ducting

Remote from walls, fire dampers must be installed in fire-resistant ducts made of sheet steel; the ducts must not have any openings.

Requirements

- Use of certified insulation materials with adequate fire resistance rating
- No openings in the insulated ducts between the fire damper and the solid wall
- Connection of rigid ducts to the non-insulated side of the fire damper using a flexible connector

Proceed as follows:

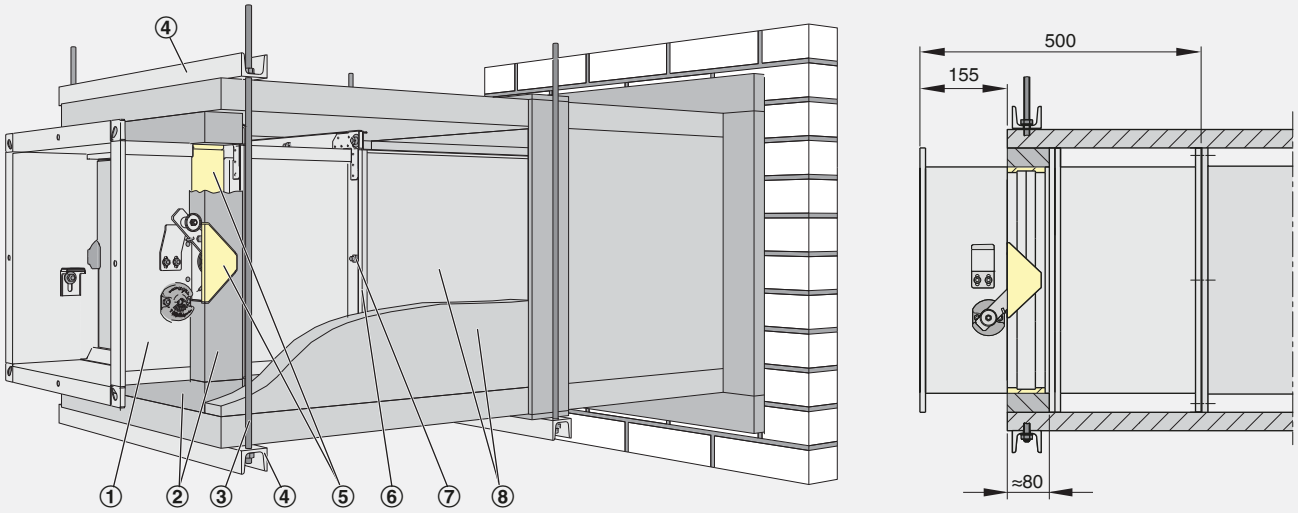
- Suspend fire damper as shown. Be sure to allow for the weight of the insulation in addition to the weight of the fire damper.
- Lead the duct up to the wall and suspend it, if necessary.
- Insulate the duct with fire protective cladding according to the manufacturer's specifications.

After installation

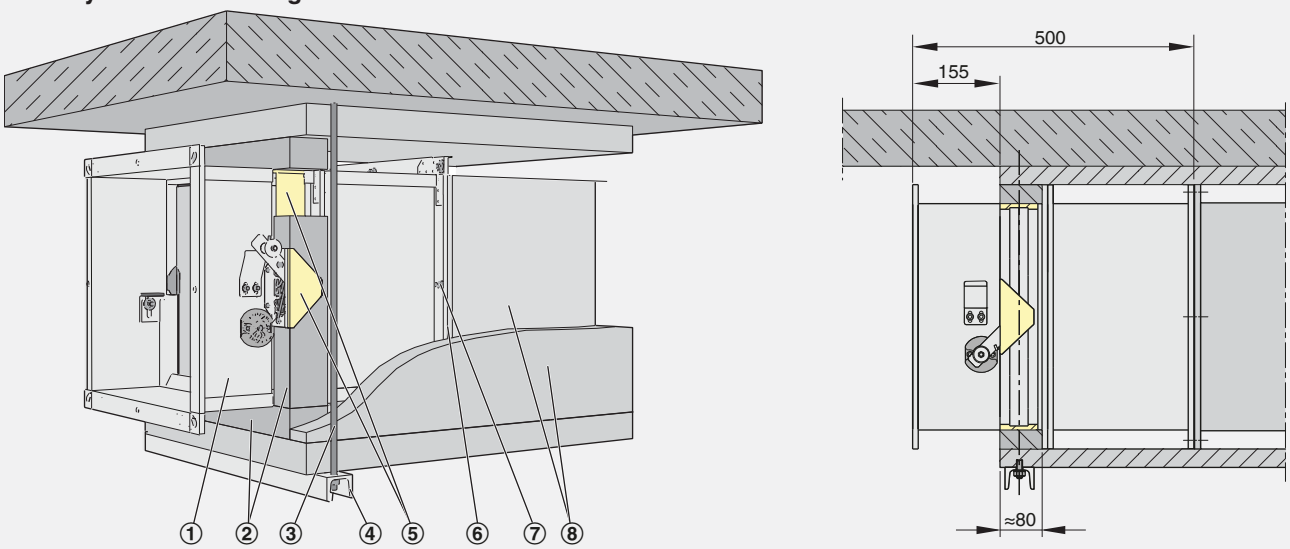
- Clean the fire damper.
- Perform a functional test of the fire damper. → P. 18
- Connect the ducting. → P. 16
- Establish the electrical connection. → P. 17

① FKA-EU
② Insulation cladding
③ Suspension, details → P. 15
④ Cross member, U50 x 38 x 5 mm, galvanised or coated steel
⑤ Insulation, mineral wool, gross density ≥100 kg/m^3, non-combustible, dimensions: 65 x 10 mm
⑥ Seal
⑦ M8 screw with nut, galvanised steel
⑧ Sheet steel duct with external cladding

Sheet steel ducting with external cladding for insulation



Directly below the ceiling slab

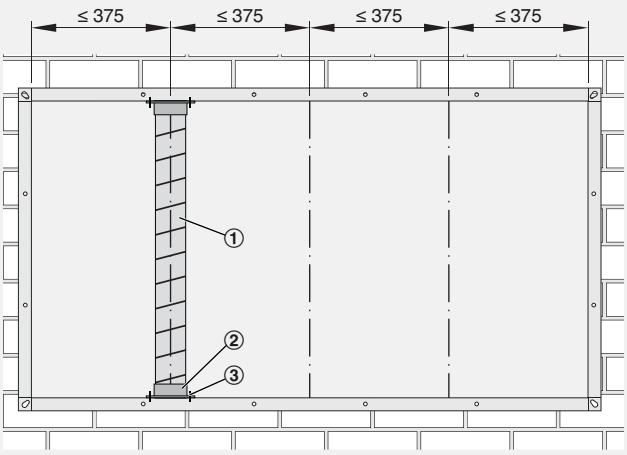


6 Installation

Remote from solid walls

Establishing reinforcement

In the vicinity of the wall passage, the duct should be reinforced as shown in the opposing figure.



① Spiral duct Ø 80 mm or steel pipe Ø 25 mm
② Flange
③ Fastening with duct

Suspension systems

Fire dampers can be suspended from solid ceiling slabs using adequately sized threaded rods.

Load the suspension system only with the weight of the fire damper. Ducts must be suspended separately.

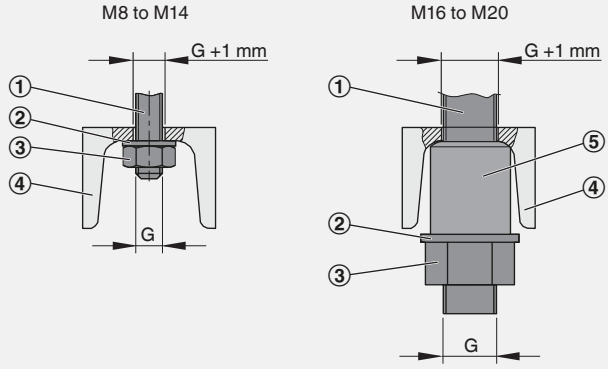
Recommended
To reduce linear dilation in case of a fire, the suspensions with lengths > 1.5 m must be provided with fireproof cladding.

Fixing to the ceiling slab

Only metal anchors with certified fire protection qualification and suitable for the ceiling must be used. Instead of anchors, threaded rods can be used and can be secured using nuts and washers.

Thread	M8	M10	M12	M14	M16	M20
Fmax (N) per threaded rod	219	348	505	690	942	1470
Max. loading capacity (kg) per threaded rod	22	35	50	70	95	150

Fixing of the cross member



① Threaded rods for suspension, M8 to M20, galvanised steel, weight of fire damper → P. 5
② Washer, M8 to M20, galvanised steel
③ Nut, M8 to M20, galvanised steel
④ Cross member, U50 x 38 x 5 mm, galvanised or coated steel
⑤ Spacer tube, Ø 30 × 33 mm, galvanised steel

7 Connecting the duct

Flexible connectors

To ensure that a fire damper always remains in its stable and safe position in a wall or ceiling slab, ducting must be installed in such a manner that it does not impose any loads on the fire damper, wall or ceiling slab particularly in the case of a fire.

Fire dampers with flexible connectors are to be connected in the following installation situations:

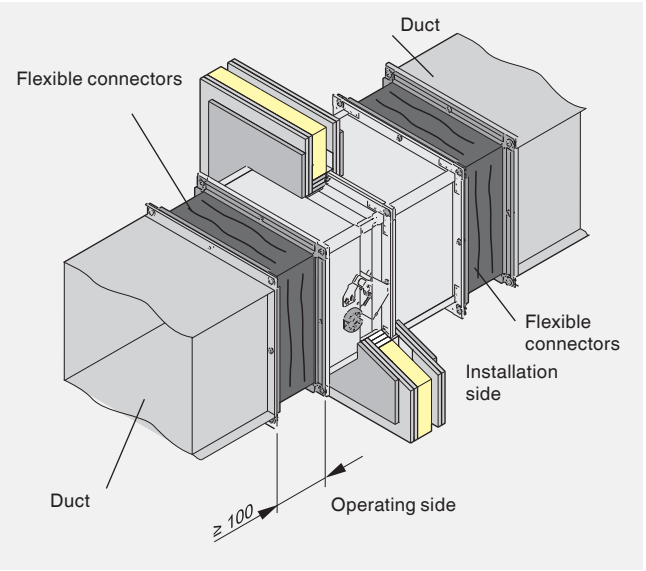
- Installation into lightweight partition walls (both sides)
- Installation remote from solid walls (one-sided on the operating side)

Flexible connectors must meet the following requirements:

- Minimum length of 100 mm (flexible length when installed)

If flexible connectors are used, equipotential bonding must be ensured. → P. 17

Flexible ducting made of aluminium may be connected to the fire damper without any need for flexible connectors.



Circular spigots

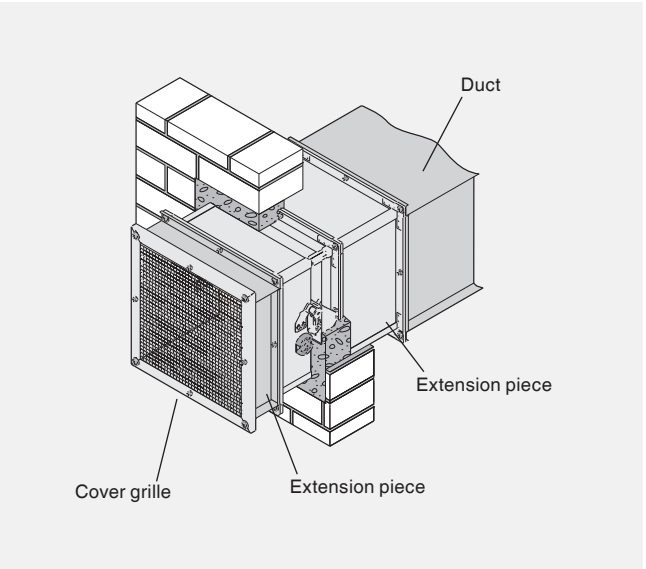
Circular spigots (attachments) can be used to connect the fire damper to circular ducts. For this purpose, additional extension pieces are required.

Cover grille

If only one end is to be ducted on site, the other end must have a cover grille (galvanised steel, mesh aperture ≤ 20 mm). For this purpose, additional extension pieces are required.

Extension piece

When using cover grilles, circular spigot plates, flexible connectors, pipe bends, etc. an extension piece may be required. Refer to the table (bottom right) for minimum lengths required.



Note
The movement of the damper blade must not be obstructed by any attachment.
The minimum distance between the tip of the open damper blade and any attachment must be at least 50 mm.

Inspection access

The interior of the fire damper must remain accessible for maintenance work and cleaning. Depending on the installation configuration it may be necessary to provide inspection panels in the connecting ducts.

Minimum length for an extension piece used with attachments

H	Operating side	Installation side L = 240	Installation side L = 500
200	–	85	–
250	–	110	–
300	–	135	–
350	20	160	–
400	50	185	–
450	75	210	–
500	100	235	–
550	120	260	–
600	150	285	25
650	175	310	50
700	200	335	75
750	220	360	100
800	250	385	125

8 Electrical connection

Danger!
Danger of electric shock! Do not touch any live components! Electrical equipment carries a dangerous electrical voltage.

- Only skilled qualified electricians are allowed to work on the electrical system.
- Switch off the power supply before working on any electrical equipment.

For all electrical wiring work, national regulations and guidelines must be observed.

Equipotential bonding

If equipotential bonding is a requirement, there must be an electrical earth connection from the fire damper to the duct.

In case of a fire, mechanical loads from the equipotential bonding must not affect the fire damper.

Limit switches for the FKA-EU with fusible link

The limit switches must be connected according to the wiring example opposite.

Indicator lights or relays can be connected as long as the performance specifications are taken into consideration.

The limit switches can be used as make or break contacts for signalling purposes.

FKA-EU with spring return actuator

The FK-EU fire damper may be equipped with a spring return actuator for a supply voltage of 230 V AC or 24 V AC/DC. Observe the performance data on the rating plate.

Connect the spring return actuator according to the wiring example opposite.

Several actuators can be connected in parallel as long as the performance specifications are taken into consideration.

BF/BLF24-T-ST TR must only be connected to safety transformers.

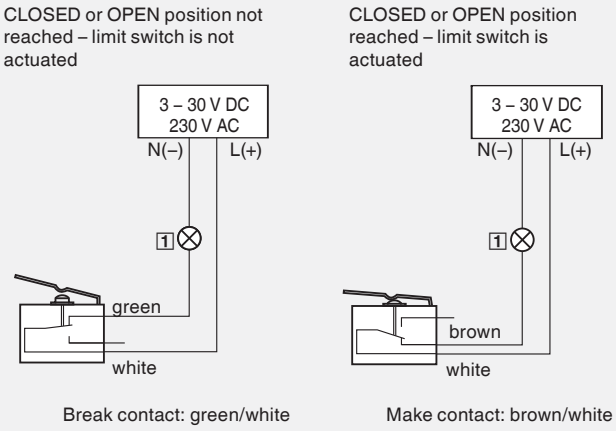
The connecting cables of the BF/BLF24-T-ST TR are fitted with plugs. This ensures quick and easy connection to the TROX AS-i bus system. For connection to the terminals, shorten the connecting cable.

AS-i/LON modules

To connect AS-i or LON modules refer to the project-specific wiring diagrams.

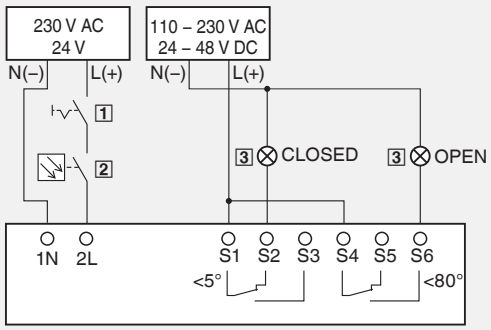
For further information on AS-i and LON refer to our website: www.troxtechnik.com.

Wiring example for limit switch



1 Indicator light or relay, to be provided by others

Wiring example for spring return actuator



1 Switch for opening and closing, to be provided by others

2 Optional release mechanism, e.g. TROX smoke detector type RM-O-3-D or RM-O-VS-D

3 Indicator light, to be provided by others

9 Functional test

FKA-EU with fusible link

General information

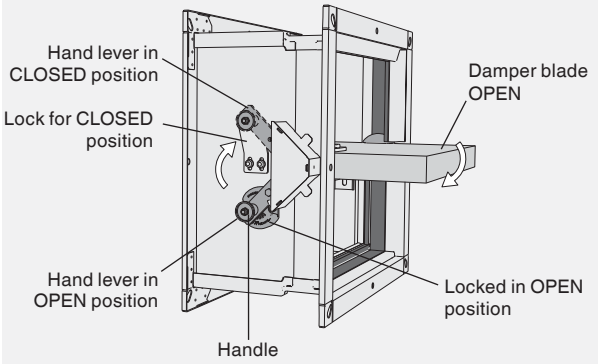
During operation at normal temperatures, the damper blade is open. A functional test involves closing the damper blade and opening it again. The exact procedure depends on the type of release mechanism.

Important!
Danger of injury during the operation of the fire damper.

There is a danger of injury in the damper blade area and in the swivelling range of the operating lever.

Do not reach into the fire damper swivelling range of the operating lever while actuating the release mechanism.

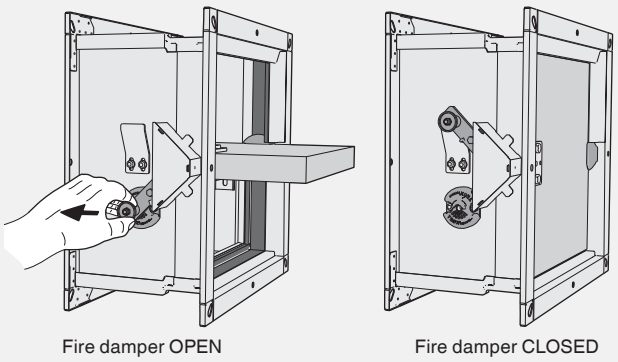
Releasing the damper blade manually



Closing the damper blade

To close the damper blade (manual release), proceed as follows:

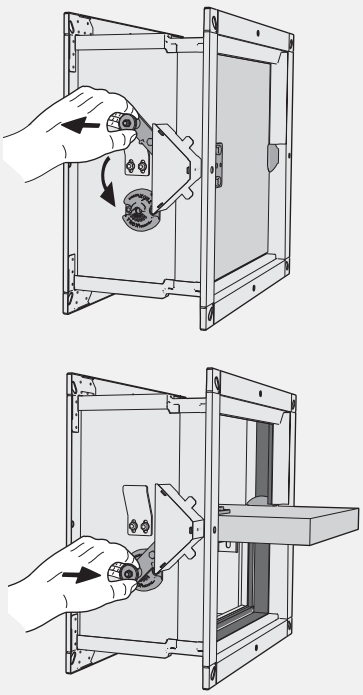
1. Grasp the collar of the hand lever as shown with the index finger, middle finger and thumb.
2. Pull the handle and release it again.
   The damper blade closes automatically and locks in the CLOSED position.



Opening the fire damper

To open the damper blade, proceed as follows:

1. Pull the collar towards you.
2. Rotate the lever by 90° downwards as shown.
3. Engage the handle in the interlock.
   The damper blade is locked into the OPEN position.



9 Functional test

FKA-EU with spring return actuator

Important!
Danger of injury when reaching into the fire damper while the damper blade is moving.

Do not reach into the fire damper while actuating the release mechanism. Make sure that the damper blade cannot be released inadvertently.

Closing/opening the damper blade with spring return actuator BLF/BF

When power is supplied to the actuator, the functional test can be performed either by remote control from the central BMS or by actuating the release mechanism on the fire damper.

To perform a functional test locally, proceed as follows:

1. Interrupt the power supply by pushing and holding the toggle switch [1].
   The spring return actuator causes the damper blade to close.
2. Reconnect the power supply by letting go of the toggle switch [1].
   The spring return actuator causes the damper blade to open.

Opening the damper blade using the crank handle

Warning!
Danger due to malfunction of the fire damper.

If the damper blade has been opened by means of the crank handle (without power supply), it will no longer be triggered by a temperature increase, i.e. in case of a fire. In other words, the damper blade will not close.
To re-establish its function, connect the power supply.

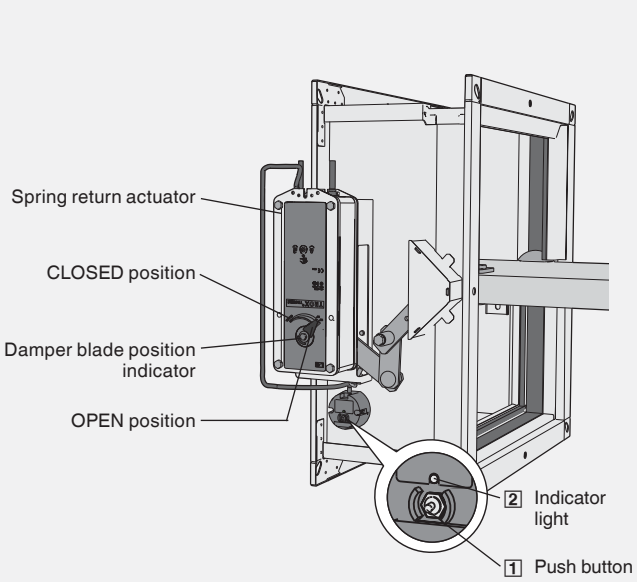
To open the damper blade, proceed as follows:

1. Insert the crank handle [3] into the opening for the spring-winding mechanism. (The crank handle is clip-fixed to the connecting cable.)
2. Rotate the crank handle [3] into the direction of the arrow [4] to just short of the travel stop.
3. Quickly rotate the crank handle [3] by approx. 90° towards the 'lock' position [5].
   The damper blade remains in the OPEN position.
4. Remove the crank handle [3].

Closing the damper blade using the crank handle

To close the damper blade (manual release), proceed as follows:

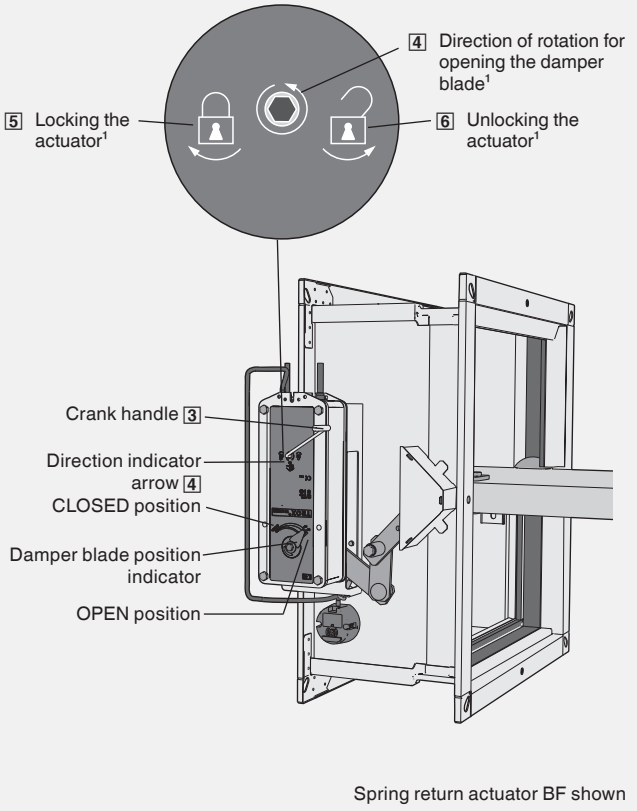
1. Insert the crank handle [3] into the opening for the spring-winding mechanism.
2. Rotate the crank handle [3] by approx. 90° towards the 'unlock' position [6] until a click can be heard.
   The spring return actuator causes the damper blade to close.
3. Remove the crank handle [3].



Spring return actuator BF shown

The indicator light [2] is illuminated when all of the following conditions apply:

- power is supplied
- the thermal fuses are intact
- the toggle switch [1] is not being pushed


4 Direction of rotation for opening the damper blade[1]
5 Locking the actuator[1]
6 Unlocking the actuator[1]
Crank handle 3
Direction indicator arrow 4
CLOSED position
Damper blade position indicator
OPEN position

Spring return actuator BF shown

[1] Rotation direction depends on the spring return actuator

10 Commissioning

Before commissioning, each fire damper must be inspected to determine and assess its actual condition.

The inspection measures to be taken are listed in the table on → P. 23.

Operation

After commissioning, the fire damper will operate automatically and will require no further intervention from the plant operator.

During operation at normal temperatures, the damper blade is open.

If the temperature in the duct or the ambient temperature rises in case of a fire, a thermal release mechanism is triggered and closes the damper blade.

11 Maintenance

Danger!
Danger of electric shock! Do not touch any live components! Electrical equipment carries a dangerous electrical voltage.

- Only skilled qualified electricians are allowed to work on the electrical system.
- Switch off the power supply before working on any electrical equipment.

Important!
Danger due to inadvertently actuating the fire damper.

Inadvertent actuation of the damper blade or other parts can lead to injuries. Make sure that the damper blade cannot be released inadvertently.

Regular care and maintenance ensure operational readiness, functional reliability, and long service life of the fire damper.

Maintenance should be carried out according to EN 15423 and EN 13306.

The operator of the system is responsible for the maintenance of the fire damper. The operator is responsible for creating a maintenance plan, for defining the maintenance objectives, and for the functional reliability of the fire damper.

Maintenance

The fire damper and the spring return actuator are maintenance-free with regard to wear but fire dampers must still be included in the regular cleaning of the ventilation system.

Inspection

The fire damper must be inspected before commissioning.

After that, the functional reliability of the fire damper must be tested at least every six months. If two consecutive tests are successful, the next test can be conducted one year later. Local requirements and building regulations must be complied with.

The inspection measures to be taken are listed in the table on → P. 23.

The test of each fire damper must be documented and evaluated. If the requirements are not fully met, suitable remedial action must be taken.

Repair

For safety reasons, repair work must only be carried out by expert qualified personnel or the manufacturer. Only original replacement parts are to be used. A functional test is required after any repair work.

11 Maintenance

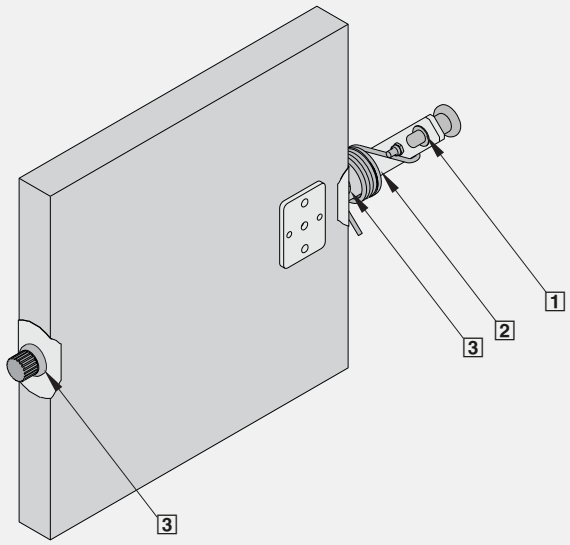
Lubricating points

Lubricate the lubricating points only if the damper blade cannot be opened or closed easily. Use only oil or grease that is free of resins or acids.

Warning!
Danger of injury when touching the release mechanism or when reaching into the fire damper while the damper blade is moving.

Do not touch the release mechanism or reach into the fire damper while actuating the release mechanism. Make sure that the damper blade cannot be released inadvertently.

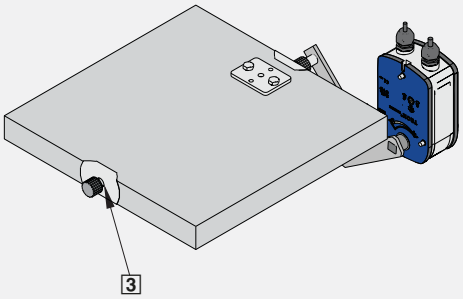
FKA-EU with fusible link

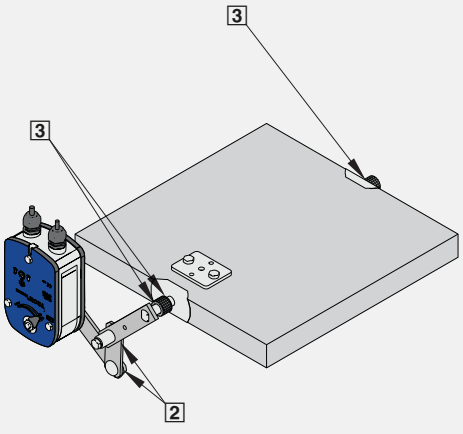


Lubricating points of FKA-EU with fusible link		
Item	**Interval**	**Description**
1	as required	Tappet of release mechanism
2	as required	Bearings
3	as required	Damper blade bearings (both sides)

Lubricating points for FKA-EU with spring return actuator		
Item	**Interval**	**Description**
2	as required	Push rod bearings
3	as required	Damper blade bearings (both sides)

FKA-EU with spring return actuator

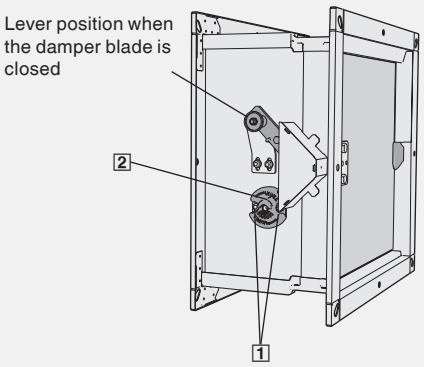




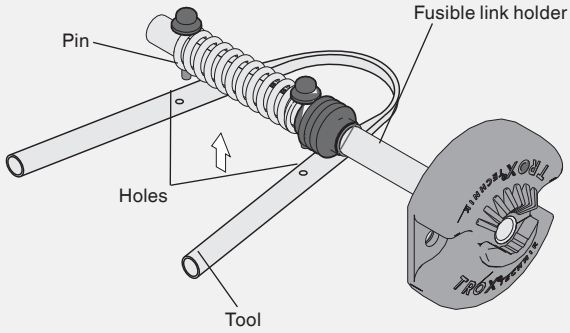
11 Maintenance

Replacing the fusible link

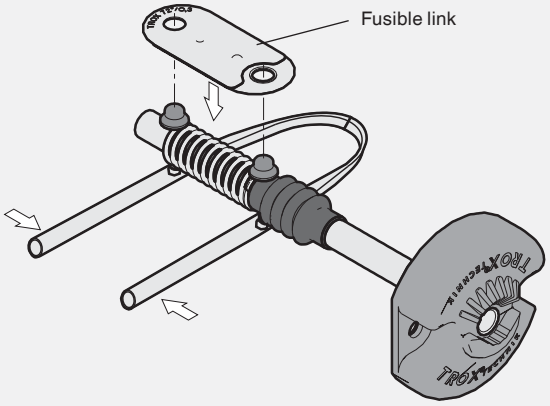
1. Close the damper blade.
2. Release screws [1] on the fusible link holder [2].
3. Remove fusible link holder [2] from the fire damper.



4. Insert the pins of the fusible link holder into the corresponding holes of the tool.
   Tool TROX part no. E 571 NE 0



5. Use the tool to compress the spring of the fusible link holder.
6. Insert fusible link (after removing used fusible link, if any).
7. Put fusible link holder [2] back into the fire damper and fix it with screws [1].
8. Carry out functional test. → P. 18



11 Maintenance

Inspection, maintenance and repair measures

Item to be checked	Interval		Required condition	Remedial action if necessary
	Before commis-sioning	Regu-larly		
Accessibility of the fire damper	×		Internal and external accessibility	Provide access
Installation of the fire damper	×		Installation into walls/ceiling slabs according to the operating manual → P. 8 – → P. 15	Install the fire damper correctly
Ducting / cover grille / flexible connector	×		Connection according to the operating manual → P. 16	Establish correct connection
Damage to the fire damper	×		No damage	Repair or replace the fire damper
Power supply to the spring return actuator	×		Power supply according to spring return actuator rating plate	Provide correct power supply
Contamination	×	×	No contamination inside	Clean the fire damper
Damper blade and seal	×	×	Damper blade / seal OK	Replace the fire damper
Function of the release mechanism	×	×	Function OK	Replace the release mechanism
Fusible link	×	×	Fusible link intact	Replace the fusible link
Function of FKA-EU with fusible link, blade closure by manual release → P. 18	×	×	• Damper blade closes independently • The spring-loaded pin of the handle engages in the CLOSED position, thus locking the damper	• Determine and eliminate the cause of the fault • Repair or replace the fire damper • Replace the release mechanism
Function of FKA-EU with fusible link, blade opening by manual release → P. 18	×	×	• Damper blade can be opened manually • Handle can be locked into the OPEN position using the release mechanism	• Determine and eliminate the cause of the fault • Repair or replace the fire damper • Adjust the mechanism • Replace the release mechanism
Function of FKA-EU with spring return actuator by the closing of the fire damper → P. 19	×	×	• Function of actuator OK • Damper blade closes	• Replace the spring return actuator • Repair or replace the fire damper
Function of FKA-EU with spring return actuator by the opening of the fire damper → P. 19	×	×	• Function of actuator OK • Damper blade opens	• Replace the spring return actuator • Repair or replace the fire damper
Function of external smoke detector	×	×	Function OK	Determine and eliminate the cause of the fault
Function of limit switches	+	+	Function OK	Replace the limit switches
Function of the external signalling (damper blade position indicator)	+	+	Function OK	Determine and eliminate the cause of the fault

× = Required

\+ = Recommended

12 Decommissioning, removal and disposal

Final decommissioning

1. Switch off the ventilation system.
2. Switch off the power supply.

Removal

1. Disconnect the wiring.

Danger!
Danger of electric shock! Do not touch any live components! Electrical equipment carries a dangerous electrical voltage.

- Only skilled qualified electricians are allowed to work on the electrical system.
- Switch off the power supply before working on any electrical equipment.

2. Remove the ducts.
3. Close the damper blade.
4. Remove the fire damper.

Disposal

For disposal, the fire damper must be disassembled.

Dispose of electronic components according to the local electronic waste regulations.